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EXAMINER	
CAMPOS, YAIMA	
ART UNIT	**PAPER NUMBER**
2185	

DATE MAILED: 06/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/790,175	WATANABE, NAOKI	
	Examiner	Art Unit	
	Yaima Campos	2185	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 April 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

RESPONSE TO AMENDMENT

1. The examiner acknowledges the applicant's submission of the amendment dated April 24, 2006. At this point, claims 1, 2, 6, 8, 15-16 and 21 have been amended, and no claims have been cancelled. There are 21 claims pending in the application; there are 3 independent claims and 18 dependent claims, all of which are ready for examination by the examiner.

I. REJECTIONS NOT BASED ON PRIOR ART

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. **Claims 1-21** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. The term "periodically" in claims 1, 8 and 15 is a relative term which renders the claim indefinite. The term "periodically" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Therefore; it is unclear to the examiner how often each of the secondary storage subsystems receive synchronization requests.

5. Any claim not specifically addressed above, is being rejected as encompassing the deficiencies of a claim upon which it depends.

II. REJECTIONS BASED ON PRIOR ART

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. **Claims** are rejected under 35 U.S.C. 103(a) as being unpatentable over

1. **Claims 1-2, 8-9 and 15-16** are rejected under 35 U.S.C. 102(b) as being anticipated by Duyanovich et al. (US 5,555,371) in view of Berger et al. (US 5,051,887).

2. As per **claim 1**, Duyanovich discloses "In a system including a plurality of primary storage subsystems and a plurality of secondary storage subsystems that are connected to each other via a network, a method for remotely copying data [[from]] **of** each of a plurality of primary volumes to a corresponding secondary volume from a plurality of secondary volumes, wherein the primary volumes are ~~presented~~ **constituted** by the primary storage subsystems, and wherein the secondary volumes are ~~presented~~ **constituted** by the secondary storage subsystems," as **["Primary data processing system 1 generates data that are to be backed up for disaster recovery purposes. Secondary data processing system 2 receives such data for disaster backup and recovery" (Column 6, lines 49-52) wherein "data are stored in peripheral data-storage system 13 that can be a typical multi-path plural-device data-storage system, hereinafter termed the primary data-storage system 13" (Column 11, lines 29-32) which comprise different storage subsystems within first storage system; note that "secondary storage system 19" is shown with a similar structure (Figure 2).**

Furthermore, it is specified that primary storage system comprises DASDs formed by different controllers, which are referred to as "subsystems" for performing updates to primary storage system (Columns 14-15, lines 61-18; Figures 2-4). Duyanovich also explains that "System inter-connection 3 operatively couples primary system 1 and secondary system 2 for effecting remote dual copying" (Figure 2 and Column 7, lines 55-57)]

"the method comprising the steps of:"

"receiving, at each of the secondary storage subsystems, remote copy requests each of which is associated with a timestamp from ~~at least~~ **each** one of the plurality of primary storage subsystems;" **[Duyanovich discloses this limitation as "time stamps may be maintained in a host systems and sent with each input-output (IO) operation" (Column 8, lines 28-29) wherein "the primary system 1 creates a remote copy session over system inter-connection 3 with secondary system" (Figure 2 and Column 8, lines 34-36)]**

receiving **periodically**, at each of the secondary storage subsystems, synchronizing requests each of which is associated with a timestamp **of a primary storage subsystem, which sends a respective synchronizing request,** from ~~a corresponding~~ **said one of the** primary storage subsystem; **[Duyanovich discloses this concept as it is taught that "for obtaining congruence between the systems 1 and 2 copies of data, it is necessary to determine the primary system 1 update sequence in secondary system 2" (Column 9, lines 36-39), "the primary host then generates a COMMIT command and inter-system message to be sent to secondary system 2" (Figure 2 and Column 14, lines 21-22) wherein "the COMMIT issuing host system 12 creates a times stamp for the**

COMMIT function" (Column 14, lines 24-25), after this COMMIT command, "secondary data-storage system updates secondary directory" (Column 14, lines 30-31) and also discloses that this action "provides update integrity in secondary system 2 of the updated data for ensuring congruence of the remote data copy in the secondary system 2 to the primary copy in primary system 1" (Column 14, lines 49-52) as a command sent from a host to synchronize a data storage system with another data storage system. Duyanovich also explains that "a host system such that primary data-storage system maintains a time stamp value synchronized with the host system time stamp clock" (Column 8, lines 31-33) as time stamps are later used to synchronize a secondary system with "primary data-storage system"].

Duyanovich also discloses having storage Ids of subsystems that update data along with each data update as **["Along with each dual data copy is a time stamp and indication of the subsystem used to write the data to primary data-storage system 13" which is referred to as a sequence number (Column 9, lines 55-57); "each sequence number is assigned by primary data storage system 13 for identifying which storage subsystem 100, 11 (FIG. 9) effected the storage of each update data record or other data unit" (Column 10, lines 23-26) wherein "such determination of sequence of recording enables system 2 to replicate the system 1 updating sequence for ensuring congruence of the remotely stored copy of the updated data with the primary system copy of such updated data by preserving update sequence integrity" (Column 10, lines 37-42) as using a sequence number/subsystem Id and timestamp for obtaining data consistency]**

"determining, at each of the secondary storage subsystems, a first time as a first time parameter based on [[the]] timestamps included in the sync requests;" **[With respect to this limitation, Duyanovich discloses that "the COMMIT issuing host system 12 creates a times stamp for the COMMIT function" (Column 14, lines 24-25)" wherein "the delayed updating of secondary directory is effective as of the latest time stamp value in the COMMIT command" (Column 20, lines 35-36)]**
and determining, at each of the secondary storage subsystems, which remote copy requests to process based on the first time parameter and timestamps associated with the remote copy requests**, thereby maintain data I/O consistency among said storage subsystems** **[With respect to this limitation, Duyanovich discloses that "along with each dual data copy is a time stamp (time of updating indication) and indication of the subsystem used to write the data to primary data-storage system 13. These time stamps and sequence numbers are stored in pending write directory 35 along with identification of the dual copied data and the address at which such dual copied data are stored in secondary data-storage system 19. Such time stamps will be used later to select which data to make addressable in the second data-storage system 19. That is, updating secondary directory 34 is deferred until termination of a current pending write session" (Column 9, 55-65) as "comparing the sequence numbers and time stamps, the integrity of data copying and the action sequence of data updating is determined" (Column 10, lines 34-37); therefore, I/O or update consistency is maintained between primary and secondary systems]**.

Duyanovich does not disclose expressly maintaining "primary storage IDs" associated with remote copy requests.

Berger discloses this concept as **[a systems of "storage devices for the input and output of information to a data processing system" in which "each write to the primary storage device is also written to a secondary storage device" to maintain data synchronization (Column 1, lines 13-24) wherein "device identification is kept on all devices in the subsystem" (Column 6, lines 16-17 and 40-56)]**.

Duyanovich et al. (US 5,555,371) and Berger et al. (US 5,051,887) are analogous art because they are from the same field of endeavor of data copying and synchronization of data storage systems.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify the remote copy request system as taught by Duyanovich and further include primary storage identification associated with remote copy requests.

The motivation for doing so would have been because Berger discloses that storage device identification should be included with copy requests **["to insure that the DASD device attached is the one that the subsystem expects" (Column 6, lines 41-42) and "to ensure the retention of information when a power out of other disablement of the devices occur and to verify that the correct physical devices are still attached to the controllers when the data storage device resumes operation" (Column 3, lines 6-12)]**.

Therefore, it would have been obvious to combine Berger et al. (US 5,051,887) with Duyanovich et al. (US 5,555,371) for the benefit of creating a method of remotely copying data to obtain the invention as specified in claim 1.

3. As per **claim 2**, the combination of Duyanovich and Berger discloses "The method of claim 1," **[See rejection to claim 1 above]** "further comprising: performing, at

each of the secondary storage subsystems, write processing in accordance with remote copy requests that are associated with timestamps indicating **an** earlier time than the first time" **[With respect to this limitation, Duyanovich discloses that a "when the consistency means determines that all of the updates are complete to the primary data-storage system, then the secondary LSA (DASD) directory is updated as of a predetermined time stamp value" (Column 6, lines 46-48) wherein "the delayed updating of secondary directory is effective as of the latest time stamp value in the COMMIT command" (Column 20, lines 34-36) and further teaches an example in which timestamp values earlier than "the lowest time stamp value received from any one subsystem" are included in a current write update session (Column 32-39). Duyanovich also discloses that "secondary data mover receives and records the received data in secondary data-storage system, logs the associated received write sequence tokens in a suitable memory for later use in the delayed update of secondary directory updating for establishing addressability of the recorded data via secondary directory" (Column 14, lines 10-16)]**.

4. As per **claims 8 and 15**, these claims are rejected for the same reasons recited above with respect to claim 1 **[See rejection to claim 1 above]**, further requiring:

a module for receiving, at each of the secondary storage subsystems, remote copy requests (***page 9, paragraph 0043 of Applicant's specification appears to define this means as CH CTL (channel controllers) 203 which store remote copy requests in remote copy queue 115***) **[Duyanovich teaches this limitation as "pending write update session ID is supplied to all receiving controllers 14" (Figure 2 and Column 9, lines 20-21) and also discloses having a "time stamp indicating when a controller**

14 received the write command" (Column 7-8) as having "controller 14" be a receiving controller. Duyanovich also teaches that "DSM (data serializer and mover) 104 tracks the requests by generating a table of requests" (Column 12, line 38-39) which is used for the same purpose as queue 115 as described by applicant]

a module for receiving **periodically**, at each of the secondary storage subsystems, synchronizing requests (***page 9, paragraph 00043 of Applicant's specification appears to define this means as disk CTL (controller) 208 and page 8, paragraph 0037 of Applicant's specification define synchronize time table 111 as storage for synchronization requests***) **[Duyanovich teaches this limitation as "In response to selected host system 16 issuing the above described COMMIT command and inter-system message, the controller updates secondary directory entries 76 and 80 using the data in pending write directory 25, all as indicated by lines 90" (det 51). Duyanovich also discloses that "DSM (data serializer and mover) 104 tracks the requests by generating a table of requests, sequence numbers and time stamps" (Column 12, line 38-39)]**

a module for determining, at each of the secondary storage subsystems, a first timer as a first time parameter based on the timestamps included in the synchronizing requests; (***page 8, paragraph 0035 of Applicant's specification defines this means as Remote Copy Manager (RCM) 105***) **[Duyanovich teaches this limitation as "host processors 12 and 16 that manage the remote dual copying processes" (Column 11, lines 27-29). Duyanovich also teaches that "DSM 104" determines "the lowest time stamp value it has received from any one subsystem in the current write update session" (Column 19, lines 42-44)]**

a module for determining, at each of the secondary storage subsystems, which remote copy requests to process (***page 8, paragraph 0035 of Applicant's specification defines this means as Remote Copy Manager (RCM) 105***) **[Duyanovich teaches this limitation as "host processors 12 and 16 that manage the remote dual copying processes" (Column 11, lines 27-29) and also teaches that "consistency means determines that all of the updates are complete to the primary data-storage system, then the secondary LSA (DASD) directory is updated as of a predetermined time stamp value" (Column 6, lines 16-19) and that "secondary data mover 108 receives the inter-system messages sent by the primary system 1 via VTAMs 106, extracts and maintains the write sequence tokens, and records the received primary system 1 updated data in secondary data-storage system 19" (Figure 2 and Column 13, lines 13-17)]**

5. As per **claims 9 and 16**, these claims are rejected for the same reasons recited above with respect to claim 2 **[See rejection to claim 2 above]**, further requiring:

"means for write processing, at each of the secondary storage subsystems, in accordance with remote copy requests that are associated with timestamps indicating an earlier time than the first time" (***page 9, paragraph 0043 of Applicant's specification defines this means as Disk CTL 208***) **[Duyanovich teaches this limitation as "secondary host system for writing copied update data to secondary peripheral data-storage system 19" and "secondary host processor 18" (Figure 2 and Column 22, lines 41-43)]**.

6. **Claims 3-7, 10-14 and 17-21** are rejected under 35 U.S.C. 103(a) as being unpatentable over Duyanovich et al. (US 5,555,371) and Berger et al. (US 5,051,887) as

applied to claims 1-2, 8-9 and 15-16 above, and further in view of Li et a. (US 6,938,045).

7. As per **claim 3**, the combination of Duyanovich and Berger discloses "The method of claim 1," **[See rejection to claim 1 above]** further comprising: managing at each of the secondary storage subsystems, a time parameter for each of the primary storage subsystems as **[With respect to this limitation, Duyanovich discloses that "the time for time stamps is initialized in primary data-storage system by a host system such that primary data-storage system maintains a time stamp value synchronized with the host system time stamp clock. Then primary system 1 creates a remote copy session over system interconnection with secondary system" (Column 8, lines 30-36)]** and also discloses having a sync request wherein a secondary storage system will processes all pending write requests having time stamp values lower than a time stamp value indicated by this sync request as **["the primary host then generates a COMMIT command and inter-system message to be sent to secondary system 2" (Figure 2 and Column 14, lines 21-22) wherein "the COMMIT issuing host system 12 creates a times stamp for the COMMIT function" (Column 14, lines 24-25), after this COMMIT command, "secondary data-storage system updates secondary directory" (Column 14, lines 30-31) and also discloses that this action "provides update integrity in secondary system 2 of the updated data for ensuring congruence of the remote data copy in the secondary system 2 to the primary copy in primary system 1" (Column 14, lines 49-52). Please note that "COMMIT" command is equivalent to a sync request (Column 20, lines 29-36)]** but fails to disclose expressly having "a second time parameter," nor "updating corresponding second time parameters at each of

the secondary storage subsystems in response to whether timestamps associated with the sync requests indicate a later time than the corresponding second time parameters of the second storage subsystems."

Li discloses having "a second time parameter" and "updating corresponding second time parameters at each of the secondary storage subsystems in response to whether timestamps associated with the sync requests indicate a later time than the corresponding second time parameters of the second storage subsystems" as [**"the present invention relates to a computer system architecture for synchronizing two remote, and independent, computer servers intended for maintaining duplicates of each other's files" (Column 1, lines 10-13) wherein "a first aspect provides a File-Modified-Date (FMD) parameter and a Directory-Modified-Date (DMD) parameter used for synchronizing changes made to a file package (i.e. a collection of files) stored in a first computing device with an associated database**" as providing a first and a second time parameters. Li also teaches that "**A second aspect of the invention assumes that the first and second computing devices are part of a local, first file server, and provides a first Package-Modified-Date (PMD) parameter stored within the first file server and associated with a specific file package, and provides a second Package-Modified-Date (PMD) parameter stored in a second database maintained in a remote, second file server." And explains that "the first and second PMD parameters permit the local file server and the remote file server to synchronize their respective databases and associated file packages" (Columns 2-3, lines 59-67 and 1-6) as further explaining the existence of first and second time parameters used to synchronize two remote data storage systems. Li discloses that "if the DMD**

parameter indicates a more recent change, then the first computing devices updates the data record in the second computing device. Furthermore, the FMD parameter in the second computing device is made equal to the DMD parameter from the first computing device" (Column 3, lines 37-43) as demonstrating updates made to a second time parameter].

Duyanovich et al. (US 5,555,371) and Li et al. (US 6,938,045) are analogous art because they are from the same field of endeavor of remote copying and synchronization of data storage systems.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify the remote data copying system as taught by Duyanovich which includes a synchronization request, further include a second time parameter which is modified when the sync requests indicate a later time than the corresponding second time parameters as changes made to a first storage system need to be updated in a second storage system as taught by Li.

The motivation for doing so would have been because Li teaches that **["the first and second PMD parameters permit the local file server and the remote file server to synchronize their respective databases and associated file packages" (Column 3, lines 4-6) and also explains that the invention permits "a database on a first computing device to synchronize itself with changes to an associated file package in another computing devices without requiring that the database be notified of modifications to the file package on a change-by-change basis" (Column 2, lines 38-44)]**.

Therefore, it would have been obvious to combine Li et al. (US 6,938,045) with Duyanovich et al. (US 5,555,371) for the benefit of creating a remote data copying system to obtain the invention as specified in claim 3.

8. As per **claims 4, 11 and 18**, the combination of Duyanovich, Berger and Li discloses "claims 3, 10 and 17," **[See rejection to claim 3 above and rejection to claims 10 and 17 bellow]** "wherein the first time is the earliest time indicated by the second time parameters" **[With respect to this limitation Duyanovich discloses an example in which timestamp values earlier than "the lowest time stamp value received from any one subsystem" are included in a current write update session (Column 32-39) as having the earliest time be a cutoff time to update/synchronize a second storage system with a first storage system].**

9. As per **claim 5**, the combination of Duyanovich and Berger discloses "The method of claim 1," **[See rejection to claim 1 above]** but fails to disclose expressly "determining a second time with which the secondary storage subsystems are synchronized based on the first time determined by the secondary storage subsystems."

Li discloses "determining a second time with which the secondary storage subsystems are synchronized based on the first time determined by the secondary storage subsystems" as **["first and second PMD parameters permit the local file server and remote file server to synchronize their respective databases and associated file packages" (Column 3, lines 4-6) wherein one synchronization scheme comprises a "local server" sending "a first time stamp" to the "remote file server" and a "remote server" sending a "second time stamp" to the "local file server;" then each server "would identify an offset-time" as the difference between its time and the received**

time. "The identified offset would be added or subtracted, as appropriate, to one of the PMD parameters to shift it to the same timing reference as the other PMD parameter" (Column 4, lines 27-49) as providing a method to determine a second time used to synchronize secondary and primary data storage systems].

Duyanovich et al. (US 5,555,371) and Li et al. (US 6,938,045) are analogous art because they are from the same field of endeavor of remote copying and synchronization of data storage systems.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify the remote data copying system as taught by Duyanovich, further determine a second time at which a secondary storage system is synchronized with a primary storage system as taught by Li.

The motivation for doing so would have been because Li teaches that **["the first and second PMD parameters permit the local file server and the remote file server to synchronize their respective databases and associated file packages" (Column 3, lines 4-6) and also explains that the invention permits "a database on a first computing device to synchronize itself with changes to an associated file package in another computing devices without requiring that the database be notified of modifications to the file package on a change-by-change basis" (Column 2, lines 38-44). Li further explains that "various approaches" may be used to determine which of the PMD parameters from the local file server or the remote local server indicates the most recent change to a data record (Column 4, lines 28-31) and teaches finding a second time to synchronize two data systems as one of the approaches (Column 4, lines 31-49)]**.

Therefore, it would have been obvious to combine Li et al. (US 6,938,045) with Duyanovich et al. (US 5,555,371) for the benefit of creating a remote data copying system to obtain the invention as specified in claim 5.

10. As per **claims 6, 13 and 20**, the combination of Duyanovich, Berger and Li discloses "claims 5, 12 and 19" **[See rejection to claim 5 above and rejections to claims 12 and 19 bellow]** "further comprising: changing, at each of the secondary storage subsystems, the first time parameter to the second time **parameter**" **[With respect to this limitation, Li discloses that in a case when a "first and second computing device, C1 and C2, ma have differing time references," then "first computing device C1 and fourth computing device C4 exchange current time stamps (in accordance with their respective local clocks CK1 and CK2) along with the initial exchange of their PMD parameter" (Column 10, lines 46-54)]**.

11. As per **claims 7, 14 and 21**, the combination of Duyanovich, Berger and Li discloses "claims 5, 12 and 19" **[See rejection to claim 5 above and rejections to claims 12 and 19 bellow]** "wherein the second time is determined when the remote copying is suspended" **[With respect to this limitation, Duyanovich discloses that "termination of a pending write update session is signaled by primary system by issuing a COMMIT command" wherein "at such termination of each write update session, the secondary directory in the system is updated as of a certain time indicated by a time stamp" (Column 10, lines 43-47) as providing a cutoff time to initial synchronization and suspend remote copying]**.

12. As per **claims 10 and 17**, these claims are rejected for the same reasons recited above with respect to claim 3 **[See rejection to claim 3 above]**, further requiring:

a module/means for managing, at each of the secondary storage subsystems, a second time parameter for each of the primary storage subsystems, and for updating the corresponding second time parameters in response to timestamps associated with the sync requests that indicate a later time than corresponding second time parameters of the second storage subsystems (***page 8, paragraph 0035 defines this means as Remote Copy Manager (RCM) 105 and paragraph 0037 explains the use of time parameter 112 and consistency group table 113***) **[With respect to this limitation, Duyanovich discloses "host processors 12 and 16 that manage the remote dual copying processes" (Column 11, lines 27-29) and also teaches that "consistency means determines that all of the updates are complete to the primary data-storage system, then the secondary LSA (DASD) directory is updated as of a predetermined time stamp value" (Column 6, lines 16-19) and that "secondary data mover 108 receives the inter-system messages sent by the primary system 1 via VTAMs 106, extracts and maintains the write sequence tokens, and records the received primary system 1 updated data in secondary data-storage system 19" (Figure 2 and Column 13, lines 13-17)]. Li further discloses that "Any database organizer may initiate a database synchronization routine with any other database organizer via network 13" (Column 10, lines 8-10) and provides a "database organizer" for each storage system (Figure 5)]**.

13. As per **claims 12 and 19**, these claims are rejected for the same reasons recited above with respect to claim 5 **[See rejection to claim 5 above]**, further requiring:
a module/means for determining a second time with which the secondary storage subsystems are synchronized based on the first time determined by the secondary storage

subsystems (*page 8, paragraph 0035 defines this means as Remote Copy Manager (RCM) 105 and paragraph 00337 explains the use of time parameter 112 and consistency group table 113*) **[With respect to this limitation, Duyanovich discloses "host processors 12 and 16 that manage the remote dual copying processes" (Column 11, lines 27-29) and also teaches that "consistency means determines that all of the updates are complete to the primary data-storage system, then the secondary LSA (DASD) directory is updated as of a predetermined time stamp value" (Column 6, lines 16-19) and that "secondary data mover 108 receives the inter-system messages sent by the primary system 1 via VTAMs 106, extracts and maintains the write sequence tokens, and records the received primary system 1 updated data in secondary data-storage system 19" (Figure 2 and Column 13, lines 13-17)]. Li further discloses that "Any database organizer may initiate a database synchronization routine with any other database organizer via network 13" (Column 10, lines 8-10) and provides a "database organizer" for each storage system (Figure 5)]**.

III. ACKNOWLEDGMENT OF ISSUES RAISED BY THE APPLICANT

Response to Amendment

8. Applicant's arguments filed April 24, 2006 have been fully considered and are not persuasive.

9. As required by **M.P.E.P. § 707.07(f)**, a response to these arguments appears below.

a. ARGUMENTS CONCERNING FORMAL MATTERS

10. The applicant's traversal of the formal requirements requested by the examiner are addressed in the following section as required by **M.P.E.P. § 707.07(f)**.

IV. ARGUMENTS CONCERNING PRIOR ART REJECTIONS

1st POINT OF ARGUMENT:

11. Regarding applicant's remarks that Duyanovich et al. (US 5,555,371) does not teach an N:M configuration of N primary storage subsystems to M secondary storage subsystems to maintain I/O consistency, it is the examiner's position that Duyanovich teaches this concept as it is taught that **[primary storage system "can be a typical multi-path plural device data-storage system" (Column 11, lines 29-32) and it is also explained that "primary system 1 and secondary system 2 may have significantly different data storage arrangements" (Column 16, lines 35-38)]**.

2nd POINT OF ARGUMENT:

12. Regarding applicant's remarks that the combination Duyanovich et al. (US 5,555,371) and Li does not teach selectively/discriminatively updating the time parameters according to SOME remote copy requests, it is the examiner's position that the combination of Duyanovich, Gerber and Li discloses this concept as **[See rejection to the claims above]**.

13. All arguments by the applicant are believed to be covered in the body of the office action or in the above remarks and thus, this action constitutes a complete response to the issues raised in the remarks dated April 24, 2006.

V. CITATION OF RELEVANT ART

1. The references to Duyanovich et al. (US 5,555,371) and Li et al. (US 6,938,045) were not correctly cited in the last Office action. The correct citation is shown on the attached PTO-892.

VI. CLOSING COMMENTS

Conclusion

14. **THIS ACTION IS MADE FINAL**. Applicant is reminded of the extension of time policy as set forth in 37 C.F.R. 1.136(a).

A shortened statutory period for reply to this final action is set to expire three months from the mailing data of this action. In the event a first reply is filed within **two months** of the mailing date of this final action and the advisory action is not mailed until after the end of the **three-month** shortened statutory period, then the shortened statutory period will expire on the data the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing data of the advisory action. In no event, however, will the statutory period for reply expire later than **six months** from the mailing date of the final action.

VII. STATUS OF CLAIMS IN THE APPLICATION

15. The following is a summary of the treatment and status of all claims in the application as recommended by **M.P.E.P. § 707.07(i)**:

a(1) CLAIMS REJECTED IN THE APPLICATION

16. Per the instant office action, **claims 1-21** have received a second action on the merits and are subject of a final rejection.

17. For at least the above reasons it is the examiner's position that the applicant's claims are not in condition for allowance.

VIII. DIRECTION OF ALL FUTURE REMARKS

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yaima Campos whose telephone number is (571) 272-1232. The examiner can normally be reached on Monday to Friday 8:30 AM to 5:00 PM.

IMPORTANT NOTE

19. If attempts to reach the above noted Examiner by telephone are unsuccessful, the Examiner's supervisor, Mr. Donald Sparks, can be reached at the following telephone number: Area Code (571) 272-4201.

20. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through

Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

June 15, 2006

Yaima Campos
Examiner
Art Unit 2185

Brian R. Peugh
Primary Examiner